

## CLAIMS

What is claimed is:

1. A tamping machine for tamping ballast underneath ties of a track, comprising:
  - a) a machine frame extending in a longitudinal direction and supported on the track by two undercarriages for mobility in an operating direction;
  - b) a sub-frame arranged between the said undercarriages and supported for mobility on the track by a further undercarriage comprising a unit motive drive, the sub-frame being connected to the machine frame by means of a frame support for displacement relative thereto in the longitudinal direction;
  - c) a vertically adjustable tamping unit and track lifting unit arranged on the sub-frame between the further undercarriage and the frame support; and
  - d) an acceleration drive provided for assisting the unit motive drive in displacing the sub-frame in the longitudinal direction, the acceleration drive being rigidly connected to the machine frame by means of a drive fastening and comprising a piston end including a bracing plunger provided for temporary application to the sub-frame, wherein a maximum stroke  $m$  of the acceleration drive is shorter than a maximum displacement path  $a$  of the sub-frame relative to the machine frame.

2. A tamping machine for tamping ballast underneath ties of a track, comprising:
  - a) a machine frame extending in a longitudinal direction and supported on the track by two undercarriages for mobility in an operating direction;
  - b) a sub-frame arranged between the said undercarriages and supported for mobility on the track by a further undercarriage comprising a unit motive drive, the sub-frame being connected to the machine frame by means of a frame support for displacement relative thereto in the longitudinal direction;
  - c) a vertically adjustable tamping unit and track lifting unit arranged on the sub-frame between the further undercarriage and the frame support; and
  - d) an acceleration drive provided for assisting the unit motive drive in displacing the sub-frame in the longitudinal direction, the acceleration drive being rigidly connected to the sub-frame by means of a drive fastening and comprising a piston end including a bracing plunger provided for temporary application to the machine frame, wherein a maximum stroke  $m$  of the acceleration drive is shorter than a maximum displacement path  $a$  of the sub-frame relative to the machine frame.

3. A method of assisting a relative displacement between a machine frame (2), moving continuously in an operating direction (12), and a sub-frame (11) which is displaceable relative thereto in the operating direction (12) with the aid of an acceleration drive (21), wherein a displacement cycle is composed of an advancing motion of the sub-frame (11) in the operating direction (12) and a subsequent local stoppage of the sub-frame (11) while the machine frame (2) moves on continuously, comprising the following steps:
  - a) simultaneous actuation of a unit motive drive (18) of the sub-frame (11) and the acceleration drive (21) for effecting an advancing motion of a bracing plunger (24), butting against the sub-frame (11), together with the sub-frame (11) from an initial position to an end position;
  - b) detaching the bracing plunger (24) from the sub-frame (11) and moving the latter forward by means of the unit motive drive (18);
  - c) switching the acceleration drive (21) to a floating position;
  - d) running the bracing plunger (24), moved forward as a result of the continuous advance of the machine frame (2), up against the sub-frame (11) which is stopped locally for carrying out a track tamping operation; and
  - e) automatic return of the bracing plunger (24) into the initial position due to the displacement of the machine frame (2) relative to the locally stopped sub-frame (11).

4. A tamping machine for tamping ballast underneath ties of a track, comprising:
  - a track-bound machine frame defining an axis and having two undercarriages for mobility in an operating direction;
  - a self-propelled sub-frame arranged between the undercarriages and having an undercarriage for support on the track, said sub-frame being connected to the machine frame for displacement relative thereto in the direction of the axis;
  - a vertically adjustable tamping unit and track lifting unit arranged on the sub-frame; and
  - an acceleration drive constructed to assist the displacement of the sub-frame and including a piston having an end and a movable bracing plunger connected to the end of the piston for applying a propulsion force to move the sub-frame, wherein the acceleration drive has a maximum stroke which is shorter than a maximum displacement of the sub-frame relative to the machine frame.
5. The tamping machine of claim 4, wherein the acceleration drive is rigidly connected to the machine frame, and the bracing plunger acts on the sub-frame.
6. The tamping machine of claim 4, wherein the acceleration drive is rigidly connected to the sub-frame, and the bracing plunger acts on the machine frame.

7. A tamping method, comprising the steps of:
  - mounting a tamping unit to a sub-frame of a tamping machine to allow movement thereof relative to a machine frame of the tamping machine;
  - assisting an acceleration of the sub-frame by a primary drive through actuation of a secondary drive through application of a propulsion force by means of a bracing plunger so that the sub-frame is advanced from a trailing end position to a leading end position in relation to the machine frame, whereby the bracing plunger no longer applies the propulsion force upon the sub-frame in the leading end position;
  - stopping the sub-frame when reaching the leading end position for allowing the tamping unit to execute a tamping operation, while the tamping machine continues to advance; and
  - switching the bracing plunger into a pressureless state to automatically return the sub-frame to the trailing end position, as the tamping machine continues to advance.
8. The tamping method of claim 1, wherein the bracing plunger bears upon the sub-frame of the tamping machine during the actuation step.
9. The tamping method of claim 1, wherein the bracing plunger bears upon the machine frame of the tamping machine during the actuation step.